O P E R A T I N G M A N U A L

tina10e1

BAG100-SD

Part Number
352-005
352-006

Remark
This Operation Manual is a supplement to the Operating Manual of the BAG100-S. The standard RS 232 interface is not active in the BAG100-SD.

DeviceNet Interface for the Bayard Alpert Gauge

INFICON

General Note
The right of alterations in the design and the technical data is reserved.
The illustrations are not binding.

Contents

		Page
1	**Ionization gauge BAG100-SD**	3
1.1	DeviceNet-Interface	3
1.2	Pin Description of DeviceNet plug	3
1.3	Technical data	3
2	**Starting-up of the BAG100-SD**	4
2.1	Setting of the baudrate and address	4
2.2	MNS - LED	4
3	**Object Structure**	5
3.1	Identity Object (Class Code 01_{hex})	5
3.2	Device Manager (DM) Object (Class Code 64_{hex})	5
3.3	Assembly Objects (Class Code 04_{hex})	8
3.3.1	Input Assemblies	8
3.3.2	Output Assemblies	9
3.4	Sensor Actuator Controller (SAC) Object (Class Code 66_{hex})	11
3.5	Sensor Pressure Object (Class Code 67_{hex})	11
3.6	Transform Pressure Object (Class Code 68_{hex})	12
3.7	Discrete Output Point Object (Class Code 69_{hex})	12
3.8	Analog Output Point Object (Class Code $6A_{hex}$)	13
4	**Supported Modes**	14
4.1	Bit Strobe	14
4.2	Change of State	14
5	**Format of real values**	15
6	**Service at INFICON**	16
7	**Disposal**	16
EEC Declaration of Conformity		17
Declaration of Contamination		18

1 Ionization gauge BAG100-SD

The BAG100-SD is equipped with the fieldbus interface DeviceNet. Thus, process auto-matization devices can easily be interconnected.

1.1 DeviceNet - Interface

The fieldbus-system DeviceNet is described in the DeviceNet specification of the Open DeviceNet Vendor Association (ODVA). The technical and functional features of the DeviceNet Standards are specified herein.

The BAG100-SD has the functionality of a DeviceNet Group 2 Only Slave.

1.2 Pin Description of DeviceNet plug

This unit uses a "Sealed Micro-Style Connector".

1.3 Technical data

Device Type	Generic
Baud Rates	125 k, 250 k, 500 k Baud
I/O-Slave Messaging	Bit Strobe, Polling, Change of State, Cyclic

Isolated Physical Layer

Input voltage range for DeviceNet option	11 - 25 Volt

Voltage levels CAN Lines:

Transmitter Requirements

Differential Output level (nominal)	2.0 V p-p
Differential Output level (minimum) connector, 50 Ohms load	1.5 V p-p
Minimum Recessive Bus voltage CAN H and CAN L	2.0 V **1)**
Maximum Recessive Bus voltage CAN H and CAN L	3.0 V **1)**
Output short circuit protection	internally limited

Receiver Requirements

Differential Input Voltage dominant	0.95 V min
Differential Input Voltage Recessive	0.45 V max
Hysteresis	150 mV typ.

1) Voltages at CAN H and CAN L are referenced to the transceiver IC ground pin. This voltage (IC ground pin) is app. 0.6 Volt higher than the V-terminal.

Address adjustment	Selectable via address switches
Baudrate selection	3 fixed baudrates and auto-baud-rate detection selectable via the address switches
Status signals	1 bicolor combined **M**odule / **N**etwork **S**tatus LED (MNS)
Operating ambient temperature	0 to 50 °C
Storage temperature	- 20 °C to + 80 °C

Key to fig. 1

Pin - no	Function:
1	Drain
2	V+
3	V-
4	CAN H
5	CAN L

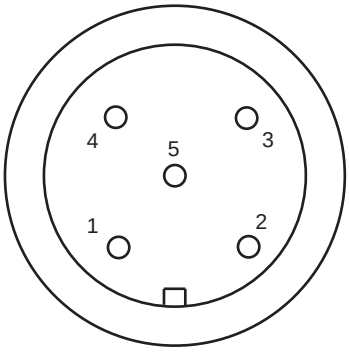

Fig. 1 Pin out for Micro Style Connectors

2 Starting-up of the BAG100-SD

For starting-up the fieldbus
- the whole system has to be installed electronically.
- the master has to be configurated
- the address of the slaves has to be set

2.1 Setting of the baudrate and address

Baudrate
Alternatively you can choose between two kinds of baudrate installations:

Auto - Baud - Rate - Detection
If the unit is switched on during data transfer on the network (minimum: 2 nodes installed with data traffic between these nodes) the unit detects automatically the installed baudrate on the bus.

Pre-installed baudrate
You can install three baudrates (125 kBaud, 250 kBaud and 500 kBaud) by using the address switches.

The function of the address switches (Figure 1) is as follows:

Address	Function
0 - 64	MAC ID (Address selection by address switches)
90	Baudrate 125 kBaud
91	Baudrate 250 kBaud
92	Baudrate 500 kBaud
99	Initialisation with default values and auto-baudrate detection

How to install a fixed baudrate
- Switch off the power of the DeviceNet option.
- Set the address switches to the address 90, 91 or 92 (depending on the baudrate you want)
- Switch on the power of the DeviceNet option.
  The MNS - LED will glow orange.
- Switch off the power of the DeviceNet option.
- Set the address switches to the MAC ID you want the device to work with
- Switch on the power of the DeviceNet option.
  The MNS - LED will flash green or alternatively red/green if a communication between the BAG100-SD and an other device takes place.

The installed baudrate is saved in EEPROM. After power ON/OFF the unit works with this installed baudrate.

How to install the auto baudrate detection
If a fixed baudrate is installed and you want to change this fixed baudrate to auto baudrate detection, you have to proceed as follows:
- Switch off the power of the DeviceNet option.
- Set the address switches to the address 99 (initialisation of all values with default values).
- Switch on the power of the DeviceNet option.
  The MNS - LED will glow orange.
- Switch off the power of the DeviceNet option.
- Set the address switches to the MAC ID you want the device to work with.
- Switch on the power of the DeviceNet option.
  The MNS - LED will flash green if a communication between the BAG100-SD and an other device takes place.

The installed auto baudrate detection is saved in EEPROM. After power ON/OFF the unit works with this installed auto baudrate detection.

2.2 MNS-LED

The MNS LED corresponds to the ODVA standard. The following additional features were integrated.

LED Colour	Function
orange permanent	The address switches are set to one of the possible baudrate settings (90, 91, 92) or to "Initialisation with default values" (99)
red permanent	Not allowed MAC ID.

3 Object structure

3.1 Identity Object (Class Code 01_{hex})

Class Code: 1 (01_{hex})
Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description	Spezification
1 (01_{hex})	get	Vendor	UINT 90 00	Vendor Identification Value: 144	DeviceNet
2 (02_{hex})	get	Device Type	UINT 00 00	Device type (Generic Device)	DeviceNet
3 (03_{hex})	get	Product Code	UINT 01 00	Vendor productcode (1)	DeviceNet
4 (04_{hex})	get	Revision	STRUCT 01 00	DeviceNet software version number (1.0)	DeviceNet
5 (05_{hex})	get	Status	WORD 01 00	Device Status	DeviceNet
6 (06_{hex})	get	Serial Number	UDINT z.B. 44 00 00 00	Serial Number	DeviceNet
7 (07_{hex})	get	Product Name	SHORT String (ITR100-D)	Product Name	DeviceNet

Services

Service Code	Name	Description	Spezification
5 (05_{hex})	Reset	complete reset	DeviceNet
14 ($0E_{hex}$)	Get Attribute Single		DeviceNet
16 (10_{hex})	Set Attribute Single		DeviceNet

3.2 Device Manager (DM) Object (Class Code 64_{hex})

Class Code: 100 (64_{hex})
Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description
49 (31_{hex})	get	Device Type	String [4] 48 43 49 47	Device type SEMI HCIG (Hot cathode ion gauge)
50 (32_{hex})	get	Standard Revision Level	String [5] 44 52 41 46 54	
51 (33_{hex})	get	Device Manufacturer Identifier	String [7] 4c 45 59 42 4f 4c 44	Vendor identification ”INFICON”

Attribut ID	Access Rule	Name	Data/Type	Description
52 (34_{hex})	get	Manufacturer Model Number	String [8] 49 54 52 31 30 30 2d 44	Catalog Number BAG100-SD
53 (35_{hex})	get	Firmware Revision Level	String [5] 31 2e 31 30 30	Software version 1.100
54 (36_{hex})	get	Hardware Revision Level	String [5] 31 2e 31 30 30	Hardware Version 1.100
55 (37_{hex})	get	Serial Number Electronic	String [5]	
56 (38_{hex})	get	Device Configuration	String [8] 49 45 31 30 30 20 4b 46	
57 (39_{hex})	get	Device Status	UINT	Device status : 1 = Initialising 2 = Idle (emmisson off) 4 = Executing (emmission on)
58 ($3A_{hex}$)	get / set	Reporting Mode	BYTE	Polling, Bit Strobe = 6 COS/Cyclic = 0
60 ($3C_{hex}$)	get	Exception Status	BYTE	Bit 0 = Alarm / Device Common Bit 1 =Alarm / Device specific Bit 2 = Alarm / Manufacturer specific Bit 3 = reserved Bit 4 = Warning / Device Common Bit 5 = Warning / Device specific Bit 6 = Warning / Manufacturer specific Bit 7 = 1 (Expanded Mode)
61 ($3D_{hex}$)		Exception Detail Alarm	Array of 9 Byte	Byte 0 : Length 2 Alarm / Dev. Common Byte 1 / 2: see below Byte 3: Length 2 Alarm/Dev. spec. Byte 4 / 5 : see below Byte 6: Length 2 Alarm / Manuf. spec. Byte 7 / 8: see below
62 ($3E_{hex}$)	get	Exception Detail Warning	Array of 9 Byte	Byte 0 : Length 2 Warning Dev. Com. Byte 1 / 2: see below Byte 3: Length 2 Warning Dev. spec. Byte 4 / 5 : see below Byte 6: Length 2 Warning Manuf. spec. Byte 7 / 8: see below
77 ($4D_{hex}$)	get	Serial Number Sensor	String [5] 30 30 30 33 36	

Detail Attribute Values Alarm and Warning:

bit	Common Exception Detail Detail [0] = Byte 1
0	internal diagnostic exception
1	microprocessor exception
2	EPROM exception
3	EEPROM exception
4	RAM exception
5	communications exception
6	internal real-time exception
7	reserved

bit	Common Exception Detail Detail [1] = Byte 2
0	power supply overcurrent
1	reserved power supply
2	power supply output voltage
3	power supply input voltage
4	routine maintanance due
5	notify manufacturer
6	reset exception
7	reserved

bit	Device Exception Detail Alarm Detail [0] = Byte 4
0	pressure fault
1	reserved
2	reserved
3	calibration fault
4	sensor 1(filament) fault
5	sensor 2 (filament) fault
6	degas fault
7	temperature fault

	Device Exception Detail Alarm Detail [1] = Byte 5
	reserved

bit	Device Exception Detail Warning Detail [0] = Byte 4
0	pressure invalid
1	pressure overrange
2	pressure underrange
3	calibration warning
4	sensor 1(filament) warning
5	sensor 2 (filament) warning
6	degas warning
7	temperature warning

	Device Exception Detail Warning Detail [1] = Byte 5
	reserved

bit	Manufacturer Exception Detail Alarm Detail [0] = Byte 7
0	Sensor 1 and 2 fault
1	
2	Emission current failure
3	Anode voltage failure
4	Kathode voltage failure
5	Temperature too high
6	Pressure too high
7	Degas failure

bit	Manufacturer Exception Detail Alarm Detail [1] = Byte 8
0	heating too high
4	Cathode voltage too high

bit	Manufacturer Exception Detail Warning Detail [0] = Byte 7
0	filament 1 broken
1	filament 2 broken
2	emission current deviations
3	Anode voltage deviations
4	Cathode voltage deviations
5	Temperature too high
6	EEPROM Device memory lost
7	EEPROM Sensor memory lost

bit	Manufacturer Exception Detail Warning Detail [1] = Byte 8
0	no emission
1	heating too high
2	Trigger setting unallowed

Services

Service Code	Name	Description
5 (05_{hex})	Reset	Complete reset
14 ($0E_{hex}$)	Get Attribute Single	
16 (10_{hex})	Set Attribute Single	

3.3 Assembly Objects (Class Code 04_{hex})

A collection of assembly objects allows the sending of attributes from different application objects in one message (i.e.: Polling I/O).

3.3.1 Input Assemblies

Messages which are sended from the ITR 100.

Input Assembly 5

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	Trip Point Source	Trip Point Status	Active Fila-ment Number	Degas Status	Sensor Status
1	Exception Status							
2	Pressure value (Low Byte)							
3	Pressure value (Low Middle Byte)							
4	Pressure value (High Middle Byte)							
5	Pressure value (High Byte)							

Input Assembly 6

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	Trip Point Source	Trip Point Status	Active Fila-ment Number	Degas Status	Sensor Status
1	Exception Status							
2	Pressure value (Low Byte)							
3	Pressure value (Low Middle Byte)							
4	Pressure value (High Middle Byte)							
5	Pressure value (High Byte)							
6	Gas Type							
7	Gas correction factor / Sensitivity (Low Byte)							
8	Gas correction factor / Sensitivity (Low Middle Byte)							
9	Gas correction factor / Sensitivity (High Middle Low Byte)							
10	Gas correction factor / Sensitivity (High Byte)							

Input Assembly 7

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	Trip Point Source	Trip Point Status	Active Fila-ment Number	Degas Status	Sensor Status
1	Exception Status							
2	Pressure value (Low Byte)							
3	Pressure value (Low Middle Byte)							
4	Pressure value (High Middle Byte)							
5	Pressure value (High Byte)							
6	Trip Point (Low Byte)							
7	Trip Point (Low Middle Byte)							
8	Trip Point (High Middle Byte)							
9	Trip Point (High Byte)							
10	Trip Point Hysteresis (Low Byte)							
11	Trip Point Hysteresis (Low Middle Byte)							
12	Trip Point Hysteresis (High Middle Byte)							
13	Trip Point Hysteresis (High Byte)							

Input Assembly 8

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	Trip Point Source	Trip Point Status	Active Filament Number	Degas Status	Sensor Status
1	Exception Status							
2	Pressure value (Low Byte)							
3	Pressure value (Low Middle Byte)							
4	Pressure value (High Middle Byte)							
5	Pressure value (High Byte)							
6	Gas Type							
7	Gas correction factor / Sensitivity (Low Byte)							
8	Gas correction factor / Sensitivity (Low Middle Byte)							
9	Gas correction factor / Sensitivity (High Middle Low Byte)							
10	Gas correction factor / Sensitivity (High Byte)							
11	Trip Point (Low Byte)							
12	Trip Point (Low Middle Byte)							
13	Trip Point (High Middle Byte)							
14	Trip Point (High Byte)							
15	Trip Point Hysteresis (Low Byte)							
16	Trip Point Hysteresis (Low Middle Byte)							
17	Trip Point Hysteresis (High Middle Byte)							
18	Trip Point Hysteresis (High Byte)							

Input Assembly 9

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Pressure value (Low Byte)							
1	Pressure value (Low Middle Byte)							
2	Pressure value (High Middle Byte)							
3	Pressure value (High Byte)							

Input Assembly 10

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Exception Status							

3.3.2 Output Assemblies

Messages which are sended to the ITR 100.

Output Assembly 1

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	res	res	Trip Point Control Source	Degas Status	Emmission ON / OFF

Output Assembly 2

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	res	res	Trip Point Source	Degas Status	Emmission ON / OFF
1	Gas Type							
2	Gas correction factor / Sensitivity (Low Byte)							
3	Gas correction factor / Sensitivity (Low Middle Byte)							
4	Gas correction factor / Sensitivity (High Middle Low Byte)							
5	Gas correction factor / Sensitivity (High Byte)							

Output Assembly 3

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	res	res	Trip Point Source	Degas Status	Emmission ON / OFF
1	Trip Point (Low Byte)							
2	Trip Point (Low Middle Byte)							
3	Trip Point (High Middle Byte)							
4	Trip Point (High Byte)							
5	Trip Point Hysteresis (Low Byte)							
6	Trip Point Hysteresis (Low Middle Byte)							
7	Trip Point Hysteresis (High Middle Byte)							
8	Trip Point Hysteresis (High Byte)							

Output Assembly 4

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	res	res	res	res	res	Trip Point Source	Degas Status	Emmission ON / OFF
1	Gas Type							
2	Gas correction factor / Sensitivity (Low Byte)							
3	Gas correction factor / Sensitivity (Low Middle Byte)							
4	Gas correction factor / Sensitivity (High Middle Low Byte)							
5	Gas correction factor / Sensitivity (High Byte)							
6	Trip Point (Low Byte)							
7	Trip Point (Low Middle Byte)							
8	Trip Point (High Middle Byte)							
9	Trip Point (High Byte)							
10	Trip Point Hysteresis (Low Byte)							
11	Trip Point Hysteresis (Low Middle Byte)							
12	Trip Point Hysteresis (High Middle Byte)							
13	Trip Point Hysteresis (High Byte)							

3.4 Sensor Actuator Controller (SAC) Objekt (Class Code 66_{hex})

Class Code: 102 (66_{hex})

Service Code	Name	Description
5 (05_{hex}) 75 ($4B_{hex}$)	Reset Sensor State	complete reset Measurement on/off (emission on/off)

The service **"Sensor State"** switches the emission on and off. Measurement values are stored in the ”Pressure value” attribute of the Transform Pressure object.

Parameter	Name
0	Emisson OFF
1	Emission ON

3.5 Sensor Pressure Object (Class Code 67_{hex})

The Sensor Pressure Object contains characteristics and behavior of the BAG100. This object is specified as a SAC-Object. All defined services for SAC-Objects are valid.

Class Code: 103 (67_{hex})

Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description
3 (03_{hex})	get	Sensor Status	BOOL	Sensor Status (Gauge ON / Gauge OFF)
6 (06_{hex})	get / set	Degas State	BOOL	Degas Status ON / OFF
10 ($0A_{hex}$)	get	Emission Current	BYTE	
14 ($0E_{hex}$)	get	Active Filament Number	BOOL	0 = Filament 1 1 = Filament 2
100 (64_{hex})	get / set	Emission ON / OFF	BOOL	

Comment to attribute 6 Degas State:

- If degas ON = 1 (Attribute 6) is set, the emission will be switched on, independingly from the value of Attribute 100 (Emission ON/OFF)
- After the automatic Degas switch off (after 3 minutes), the emission will still remain. Degas OFF and Degas ON has to be set to restart the Degas mode.

Services

Service Code	Name	Description
5 (05_{hex})	Reset	Complete reset
14 ($0E_{hex}$)	Get Attribute Single	
16 (10_{hex})	Set Attribute Single	
50 (32_{hex})	Degas	Degas ON / OFF

The Service Degas switches Degas On or Off:

Parameter	Name
0	Degas OFF
1	Degas ON

3.6 Transform Pressure Object (Class Code 68_{hex})

Class Code: 104 (68_{hex})
Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description	Spezification
1 (01_{hex})	get	Pressure Value	REAL	Pressure Value	SEMI
3 (03_{hex})	get / set	Pressure Units	BYTE	0 = mbar default 1 = Torr	SEMI
4 (04_{hex})	get / set	Gas Type	BYTE	4 = Argon 7 = H2 13 = N2 default >=187 Gas correction factor / Sensitivity valid	SEMI
5 (05_{hex})	get / set	Gas correction factor / Sensitivity	REAL	Gas factor	SEMI

Comment to attribute 5 gas correction factor / Sensitivity:
For a mixture of different gases you could specify a special factor. The used value corresponds to the relativ probability of the ioniozation. The value for nitrogen is:
relativ probability of the ioniozation = 1.

For this relativ probability of the ioniozation you have to use the value 5000 for the sensitivity. Other values could be calculated by the formula:
sensitivity = relativ probability of the ioniozation * 5000

If you want to work with a user defined sensitivity, the gas type has to be set to values > = 187.

Services

Service Code	Name	Description
14 ($0E_{hex}$)	Get Attribute Single	
16 (10_{hex})	Set Attribute Single	
75 ($4B_{hex}$)	Select Programmed Gas Type	4 = Argon, 7 = H2, 13 = N2

3.7 Discrete Output Point Object (Class Code 69_{hex})

Class Code: 105 (69_{hex})
Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description
3 (03_{hex})	get	Trip Point Status	BOOL	0 ↔ relay deactivated
100 (64_{hex})	get / (set)	Trip Point	REAL	
102 (66_{hex})	ge t/ (set)	Trip Point Hysteresis	REAL	Hysteresis in %
103 (67_{hex})	get / (set)	Trip Pointupper Value	REAL	
104 (68_{hex})	get / (set)	Trip Pointlower Value	REAL	
105 (69_{hex})	get / set	Trip Point Control Source	BOOL	0 ↔ Poti; 1 ↔ DeviceNet You can decide whether the trip point is set by the potentiometer or by DeviceNet.

Services

Service Code	Name	Description	Specification
14 ($0E_{hex}$)	Get Attribute Single		DeviceNet
16 (10_{hex})	Set Attribute Single		DeviceNet

Explanation to attributes 100 - 104
It is possible to set the trip point by the two values "trip point" and "trip point hysteresis" or by "trip point lower value " and "trip point upper value".

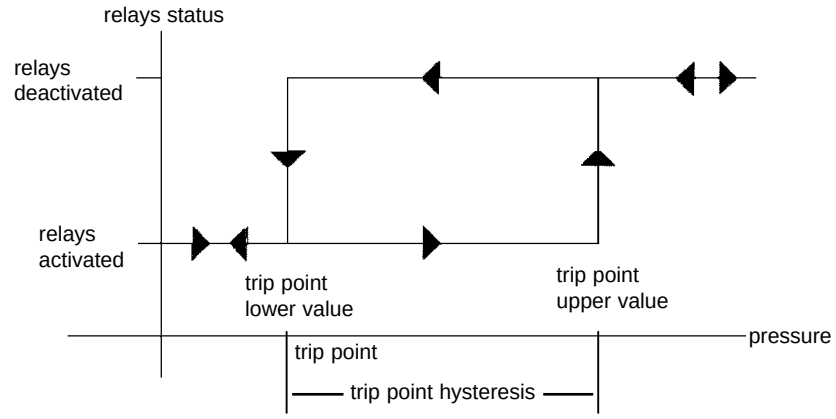

Fig. 2 Relay status activated by trip points

If the pressure decreases under the trip point (trip point lower value) the relay gets activated,

if the pressure increases over the trip point upper value (trip point + hysteresis) the relay gets deactivated.

The two modes
- trip point upper value / trip point lower value or
- trip point / trip point hysteresis can be used alternatively.

3.8 Analog Output Point Object (Class Code $6A_{hex}$)

Class Code: 106 ($6A_{hex}$)
Class Attributes: None

Instance Attributes

Attribut ID	Access Rule	Name	Data/Type	Description
101 (65_{hex})	get / set	Analog Output Mode	BYTE	() ↔ log; 1 ↔ lin („C“)
102 (66_{hex})	get / set	Analog Output Mode Extension	BYTE	A, 2, 3, 4, 5, 6, 7, 8, 9 = linear D = log. C = Mantissa and Exponent separate 0, 1, B, E, F = not used **(See description in the user manual of the BAG100)**

Services

Service Code	Name
14 ($0E_{hex}$)	Get Attribute Single
16 (10_{hex})	Set Attribute Single

4 Supported Modes

The BAG100-SD acts as a "DeviceNet Group Two Only Slave". It supports the modes Polling, Bit-Strobe, Change of State/ Cyclic and explicit messagges.

Attention Interscan delay: 25 ms

4.1 Bit Strobe

The emission may be switched on and off by the Bit-Strobe application.
Bit-Strobe Bit = 1 → emission on
Bit-Strobe Bit = 0 → emission off

The Bit-Strobe response message is Input Assembly 5.

After the the bit strobe message the returned measurement value is not the actual value. You will receive the correct value after several bit strobe commands because of the transient behaviour of the BAG100 (see user manual BAG100).

4.2 Change of State

Connection Object Instance Attribute (Class 5 / Instance 4/ Attribut 100)

Attribut ID	Access Rule	Name	Data/Type	Description
100 (65_{hex})	get / set	Pressure Change	BYTE	see below

Pressure Change
The attribute describes the deviation in percent of the measurement value which will result in a COS message on the bus. Possible values for "Pressure Change": 1 - 100 %.

5 Format of real values

According to the IEEE-754 standard real values are stored in floating point format. The floating point values are transmitted according to the following format:

Byte	2	3	4	5
Content	SEEE EEEE	EMMM MMMM	MMMM MMMM	MMMM MMMM

S means: Sign Bit, which means 1 = negative, 0 = positive
E means: Two-complement exponents with offset 127
M means: 23 bit mantissa. The most significant bit is always 1 and is, therefore, not stored.

Example:
The value -12.5

Byte number of the floating point value	Byte 3: C1 hex	Byte 2: 48 hex	Byte 1: 00 hex	Byte 0: 00 hex
Content	SEEE EEEE	EMMM MMMM	MMMM MMMM	MMMM MMMM
Content in this example	1100 0001 binary	0100 1000 binary	0000 0000 binary	0000 0000 binary

Sign bit:
The bit S in this example is 1. That means the sign bit of the whole value (or of the mantissa) is „minus“.

Exponent:
The EEEE EEEE have the value: 1000 0010 binary. This value converted in decimal it is: 130 decimal. This value has the offset 127. So the exponent is: 130 - 127 = 3

Mantissa:
Because the mantissa is normalized the most significant bit has the value 1, the next bit has the value 0.5, the next bit has the value 0.25.

Bit number	Value of the bit, if the bit is set to 1
bit 24 (MSB)	1
bit 23	0.5
bit 22	0.25
bit 21	0.125
bit 20	0.0625
bit 19	0.03125
bit 18	0.015625
bit 17	0.0078125
and so on	

The MMM MMMM MMMM MMMM MMMM MMMM (23bit) have the value 100 1000 0000 0000 0000 0000. The most significant bit (MSB) is always 1 (and not stored). You have to implement this most significant bit.

So the value of the mantisse is: 1100 1000 0000 0000 0000 0000 (binary).

Bit number		Value
Bit 24 is set to 1	→	1
Bit 23 is set to 1	→	+ 0.5
Bit 20 is set to 1	→	+ 0.0625

So the mantissa has the value 1.5625

Whole Value:
The whole value is: $-1.5625 \cdot 2^3 = -12.5$

6 Service at INFICON

Warning

Contaminated products (e.g. radioactive, toxic, caustic or microbiological hazard) can be detrimental to health and environment.

Products returned to INFICON should preferably be free of harmful substances. Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a duly completed declaration of contamination (see Annex).

Products that are not clearly declared as „free of harmful substances“ are decontaminated at the expense of the customer.

Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.

7 Disposal

Warning

Contaminated parts

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handlinmg contaminated parts.

Warning

Substance detrimental to the environment

Products or parts thereof (mechanical and electric components, operating fluids etc.) can be detrimental to the environment.

Dispose of such substance in accordance with the relevant local regulations.

Separating the components

After disassembling the product, separate its components according to the following criteria:

Contaminated components

Contaminated components (radioactive, toxic, caustic or biological hazard etc.) must be decontaminated in accordance with the relevant national regulations, separated according to their materials, and disposed of.

Other components

Such components must be separated according to their materials and recycled.

EEC Declaration of Conformity

as defined by the Directive relating to machinery 98/37/EG, Appendix IIb.

We -INFICON - herewith declare that the products defined below meet the basic requirements regarding safety and health of the relevant EEC directives by design, type and the versions which are brought in to circulation by us.

We also declare that the equipment mentioned below complies with the provisions of the Directive relating to electrical equipment designed for use within certain voltage limits 73/23/ EEC and the Directive relating to electromagnetic compatibility 89/336/EEC.

Product:

DeviceNet Interface of the BAG100-SD

Part Number

352-005
352-006

Standards
Harmonized and international / national standards and specifications:

- EN 61010 - 1 - 1993
- EN 50081 - 1 - 1992
- EN 50082 - 2 - 1995
- VDE 0411 Teil 1 / 03.94
- VDE 0839 Teil 81 - 1 / 03.93
- VDE 0839 Teil 82 - 2 / 02.96

Balzers, 4 May 2001

Hannes Fischer, Product Manager

Balzers, 4 May 2001

Dr. Georg Sele, Technical Support Manager; Quality Representative

Declaration of Contamination

The service, repair, and/or disposal of vacuum equipment and components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay.
This declaration may only be completed (in block letters) and signed by authorized and qualified staff.

1 Description of product

Type _____
Article Number _____
Serial Number _____

2 Reason for return

_____
_____
_____

3 Operating fluid(s) used (Must be drained before shipping.)

_____
_____

4 Process related contamination of product:

toxic	no ❑ 1)	yes ❑
caustic	no ❑ 1)	yes ❑
biological hazard	no ❑	yes ❑ 2)
explosive	no ❑	yes ❑ 2)
radioactive	no ❑	yes ❑ 2)
other harmful substances	no ❑ 1)	yes ❑

The product is free of any substances which are damaging to health yes ❑

1) or not containing any amount of hazardous residues that exceed the permissible exposure limits

2) Products thus contaminated will not be accepted without written evidence of decontamination!

5 Harmful substances, gases and/or by-products

Please list all substances, gases, and by-products which the product may have come into contact with:

Trade/product name	Chemical name (or symbol)	Precautions associated with substance	Action if human contact

6 Legally binding declaration:

I/we hereby declare that the information on this form is complete and accurate and that I/we will assume any further costs that may arise. The contaminated product will be dispatched in accordance with the applicable regulations.

Organization/company _____
Address _____ Post code, place _____
Phone _____ Fax _____
Email _____
Name _____

Date and legally binding signature _____

Company stamp

This form can be downloaded from our website.

Copies:
Original for addressee - 1 copy for accompanying documents - 1 copy for file of sender

INFICON

INFICON The Instrumental Difference

INFICON LIMITED:

FL-9496 Balzers, Principality of Liechtenstein
Phone: +423 388 3111 Fax: +423 388 3700 www.inficon.com

UNITED STATES FRANCE GERMANY LIECHTENSTEIN UNITED KINGDOM CHINA JAPAN KOREA SINGAPORE TAIWAN

Due to INFICON's continuing program of product improvements, specifications are subject to change without notice.
Visit our website for contact information and other sales offices worldwide. **www.inficon.com**